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THE UNIVERSITY OF ALBERTA

LAND USE IMPACTS OF LIGHT RAIL TRANSIT IN EDMONTON'S CENTRAL BUSINESS DISTRICT

BY

© WILLIAM D. SABEY

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENTS OF THE REQUIREMENTS FOR THE DEGREE

OF

MASTER OF SCIENCE

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EDMONTON, ALBERTA

SPRING, 1988

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Supervisor

DATE: APRIL 25, 1988

ABSTRACT

In 1978 the city of Edmonton, Alberta, became the first North American city to operate a modern Light Rail Transit (LRT) system. The objective of this thesis is to determine if the LRT system has had an effect on land development in Edmonton's Central Business District (CBD).

There are conflicting reports about rail rapid transit's capability of generating land development. A review of the literature found many documents which stated that rail rapid transit had a significant impact in cities such as Toronto, Washington, Munich, Buffalo, and Pittsburgh. A study of the Bay Area Rapid Transit system in San Francisco, however, found little influence on urban development.

The methodology used in this thesis was to survey the owners and tenants of downtown buildings, to determine if their choice of location was influenced by the LRT system. A non-biasing survey was developed. The questions in this survey were based on a model of urban land economics which identified thirteen locational factors. The survey produced data which was analyzed to find evidence of a direct causal link between the LRT system and the pattern of land development in the CBD.

This thesis has found that Edmonton's LRT system has not played a significant role in shaping urban development. Several factors have hindered the impact of the LRT system. Most importantly, the present system provides incomplete coverage of the city, serving only the northeast corridor. Secondly, major tenants such as the provincial government administration were not concerned about accessibility to the LRT. Finally, the growth in the number of parking stalls in downtown Edmonton has

strengthened the competitiveness of the automobile for work trips into the CBD. The findings of this thesis demonstrate that transportation planners and politicians cannot expect rail rapid transit to strengthen and revitalize their city's CBD on its own, without the assistance of other supporting policies. The decision to construct a rail rapid transit system should be based on transportation factors rather than on anticipated land use impacts.

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LIST OF ABBREVIATIONS

BART	Bay Area Rapid Transit
CBD	Central Business District
CUTA	Canadian Urban Transit Association
LRT	Light Rail Transit
WMATA	Washington Metropolitan Area Transit Authority

1.0. INTRODUCTION

1.1. Problem Statement:

With over 80% of North Americans living in urban areas, it has become an important societal goal to create livable cities. Many cities have turned to rapid transit as a method of improving the quality of urban life. Rail rapid transit has been promoted as a panacea of urban problems. Proponents of rapid transit maintain that it provides fast, efficient transportation within the city, it reduces congestion of roadways, it reduces automobile exhaust, it reduces traffic noise, and it minimizes the land area required for roadways and parking. Moreover, it is claimed that rapid transit encourages the development of a strong, vital Central Business District (CBD), giving the city character and atmosphere. This study is concerned with the influence of Light Rail Transit on urban development within the CBD of the city of Edmonton, Alberta, Canada.

1.2. Research Objective:

In 1978 Edmonton became the first North American city to operate a rail rapid transit system using modern Light Rail Transit (LRT) technology. The objective of this study is to determine if the LRT system has had an effect on land development in Edmonton's Central Business District. Specifically, the intent is to determine whether or not the LRT system has been a significant contributing force in shaping the spatial pattern of

land development in downtown Edmonton. The findings may have implications on land use planning and transportation planning policies.

1.3. LRT System Description

In the family of urban rail transit, streetcar systems and heavy rail transit occupy opposite ends of the spectrum. Streetcar systems typically operate on a shared right-of-way in mixed traffic. Construction costs are low, but so is capacity. Heavy rail transit operates within a fully controlled, exclusive right-of-way. This type of right-of-way is very expensive to construct, but it results in a transit system with a very high capacity. Light rail transit merges characteristics of the streetcar with characteristics of heavy rail transit. This produces a rail transit system which combines operating flexibility and high capacity. LRT has "lighter" right-of-way requirements than heavy rail transit. LRT operates on a right-of-way which may be physically separated from other traffic by curbs, street closures, bridges, and tunnels, yet level crossings at roadways are permitted. (Vuchic,1981). This results in lower construction costs and lower capacity than heavy rail transit, placing LRT toward the centre of the rail transit spectrum. LRT technology is very advantageous in urban areas which need increased transit capacity but do not require the high capacity of heavy rail transit and can therefore take advantage of LRT's lower construction costs.

Edmonton's LRT system presently has a single line running from the CBD to the northeast edge of the city. When the LRT system opened in 1978 it

was 7.2 kilometers (km) in length, consisting of a 1.6 km subway section in the downtown and a 5.6 km at-grade section along a freight railway right-of-way in the northeast. The northeast at-grade section was extended by 2.2 km in 1981, and the downtown subway section was extended by 0.9 km in 1983, bringing the total length to 10.3 km.

There are four underground stations within the CBD plus four at-grade stations along the northeast section. The LRT system is complemented by an extensive feeder bus system converging at the four outlying stations. In 1985 the LRT accounted for 7% of all trips made into the CBD during the AM peak hour. Table 1.1 shows the growth in daily ridership on the LRT from the first year of operation to the present.

YEAR	WEEKDAY RIDERSHIP
1978	18,222
1979	19,063
1980	20,291
1981	23,199
1982	22,261
1983	20,420
1984	25,342
1985	24,522
1986	25,346

Table 1.1 LRT Ridership 1978 - Present

Transit ridership is affected by the number of people working in the CBD. In Edmonton, employment in the CBD grew under the influence of Alberta's oil boom economy to approximately 65,200 people by 1981. At that

time the Planning Department of the City of Edmonton forecasted that CBD employment would rise to 78,000 once office space then under construction was occupied. In addition, the construction of projects that were in the planning stages would cause employment in the CBD to reach 115,600.

Due to the economic downturn of 1982 CBD employment did not grow as predicted, but stabilized at the 1981 level. Transit ridership, however, peaked in 1981 and has steadily declined ever since. The screenline counts in Table 1.2 show that by 1985 the number of transit trips being made into the CBD during the AM peak hour was actually lower than in 1977, both in absolute numbers and as a percentage of total trips. Edmonton Transit's share of trips into the CBD declined during this period from 43% to 35% despite the introduction of the LRT system.

	Bus	LRT	Total Transit	Auto	Total Trips
1972	9,272	–	9,272	19,591	28,863
	32%	–	32%	68%	100%
1977	13,787	–	13,787	18,397	32,184
	43%	–	43%	57%	100%
1980	13,247	3,087	16,334	20,500	36,834
	36%	8%	44%	56%	100%
1983	11,635	2,144	13,779	22,376	36,155
	32%	6%	38%	62%	100%
1985	10,166	2,726	12,892	23,804	36,696
	28%	7%	35%	65%	100%

Table 1.2 CBD Screenline Counts

Person Entries By Mode
7:30 AM - 8:30 AM

The demise of transit ridership can be partially explained by the increasing competitiveness of the automobile. Table 1.3 reveals that the growth in the number of parking stalls in the CBD has been far greater than the growth in the number of trips being made into the CBD during the AM peak hour. As a result there is an abundance of inexpensive parking.

It is expected that the LRT will attract more riders once the system becomes more complete. A south line is under construction and there are tentative plans for a line to the west end of the city.

	CBD Screenline Counts		CBD Parking Stalls
1977	32,184	1976	20,313
1980	36,834	1980	24,040
1983	36,155	1982	26,148
1985	36,696	1984	29,923
Increase: 1977-1985	14%	Increase: 1976-1984	47%

Table 1.3 Comparison of the Growth in Screenline Counts and in Parking Stalls

1.4. Organization of the Thesis

Chapter 2 provides background information which was obtained through a review of the literature. This chapter establishes the setting for the remainder of the thesis.

Chapter 3 outlines the research methodology used in this thesis. This chapter describes the procedures that were used to obtain data.

Chapter 4 discusses the analytical methods which were employed, and presents and interprets the data.

Chapter 5 presents the conclusions arising from this research.

Survey questionnaires, correspondence, and tables of data are contained in the Appendix.

2.0. LITERATURE REVIEW

2.1. Chapter Summary

This chapter provides an historical overview of the impact that transportation has had on urban form. The evolution of urban transportation technology has played an important role in the development of the industrial city. Urban form has been shaped by transportation improvements such as the horse-drawn tram, the electric streetcar, and the automobile. This historical overview leads to a more specific investigation of the land development impacts of rail rapid transit systems currently in operation in North America. There are conflicting reports about rail rapid transit's capability of generating land development.

The literature review has led to a focusing of the thesis topic. It has identified the need for an in-depth study of Light Rail Transit's impacts on land development within the CBD.

2.2. Historical Development of the City

The two major modes of transportation within the industrial cities of the nineteenth century were walking for the working class and horse-drawn carriage for the wealthy. City form was a function of the travel time characteristics of these modes of travel. Closely surrounding the Central Business District (CBD) were the densely populated homes of the working class. These people had to live within a reasonable walking time from their place of work in the CBD. The wealthy, who could afford a horse and carriage, and could therefore travel further in an equal amount of time, lived beyond the working class zone in much more spacious surroundings. (Kolars and Nystuen,1974)

The 1860's saw the introduction of a new mode of travel to the urban transportation system: horse-drawn trams on rail tracks. This mode of travel expanded the functional area of the city. It increased the area which was within reasonable commuting time of the CBD, allowing members of the working class to live further away from their place of employment without increasing their travel time to work. By providing improved transportation along a fixed route, the trams created market forces which generated linear development along the length of the route. This marked a change in city form.

Improvements were made to the tram in the 1880's when electricity replaced horses as a source of power for propulsion. Electric streetcars had the advantage of increased speed over the horse-drawn trams . This allowed an even greater expansion of the functional area of the city, as greater distances could be covered in the same amount of time. This caused

the linear development pattern to become more pronounced, creating a spoke-like urban form. (Canadian Urban Transit Association (CUTA),1985).

The popularization and affordability of the automobile, beginning in the 1920's and increasing strongly after World War II, created a new pattern of accessibility. Now, with the construction of roads the urban area expanded outwards in all directions as the automobile brought the urban hinterland to within reasonable commuting time of the CBD. The roadway pattern became the major determinant of urban form.

The ever increasing use of the automobile brought about intense congestion within the CBD of the large cities. Not only automobiles were delayed by traffic congestion, so were the downtown streetcars which shared the right-of-way within the CBD. This led to the construction of underground or elevated rail transit lines in some of the larger cities such as New York, Chicago, and Toronto.

It is noted in the Canadian Urban Transit Guide that, historically, "one of the major elements in the process of change in urban areas has been the mode of transportation available." (CUTA,1985,p.27-5). This thesis study is concerned with the possible effects that rail rapid transit is capable of having on urban form and development.

2.3. Development Impacts of Rail Rapid Transit Systems

During recent decades many transit planners have assumed that high density development would automatically spring up around newly constructed rail rapid transit stations. This belief was primarily a result of the land

development impacts experienced by the city of Toronto during the late 1950's and the 1960's. In a 1967 rapid transit planning report prepared by Simpson & Curtin for the City of Calgary, it is stated:

> There has never been an "unsuccessful" rapid transit system. Toronto believes that their system would be a financial success even if they collected no fares from passengers - land development and rising tax assessments are returning the investment.
>
> Toronto fortifies the land development influences of rapid transit. In the five-year period from 1959 to 1963, almost half of all high-rise apartment development in the metro area occurred in the four planning districts straddling the Yonge Street Subway. Almost 90% of all office construction in this same period took place in three planning districts which the subway bisects. In other words, two-thirds of all new development in metro Toronto in this five year period took place within five-minutes walk from the Yonge Street Subway.
>
> The land development implications of high-speed transit - which have been the universal experience of all cities with rapid transit - far outweigh the revenue/cost ratio developed by the transit system itself... Development of rapid transit has consistently generated more compact and orderly development with a strong downtown and clustered residential development.
> (Simpson & Curtin, 1967, pp.9-11)

Simpson & Curtin argued that new rapid transit systems automatically induce land development to occur in the vicinity of its stations. Their model of rapid transit development impacts was an extreme simplification of the real world. According to this model a rapid transit system could be constructed in any city, under any economic circumstances, and the result would be a massive infusion of development and the creation of a strong CBD. If this model was accurate any city in need of revitalization would derive a net benefit from an investment in a rapid transit system. This model has never been proven.

Nevertheless, there continues to be support for the idea that rail transit is capable of generating development. The Washington Metropolitan Area Transit Authority (WMATA) estimated that three years after their first Metro segment opened it had already generated $970 million worth of private development. They projected that $5 billion in development would occur in the vicinity of Metro stations once the system was complete. However, the WMATA did not prove that the development had taken place in response to the construction of the Metro. The development might have taken place even if the Metro did not exist. In support of the WMATA statistics Planning Magazine stated that "more than half of the dollar value of new, nonresidential construction in the Washington area during the last four years has been concentrated ... within a fifteen minute walk from a Metro station" (Planning Magazine,1984,p.11). This statistic is misleading. First, not many people are willing to walk fifteen minutes from a transit station to get to work. Second, the statement suggests that a cause-and-effect relationship exists between accessibility to the Metro and the location of development, yet no supporting evidence is given. The

development may have taken place where it did due to other factors.

The Journal of Transport Economics and Policy published a paper in September, 1980, entitled "Response of Urban Real Estate Values in Anticipation of the Washington Metro". The authors of this paper tested the theory that, by influencing the pattern of development, rapid transit systems alter the spatial distribution of urban real estate values. They concluded that there is "some tentative empirical support for the thesis that real estate property [value] shifts do indeed occur in areas near [Washington's] transit stations." (Damm et al,1980,p.333) However, it is not clear if the impacts experienced in Washington were more a result of market forces created by the Metro system or of policies pursued by the Washington Metropolitan Area Transit Authority and local officials. New high-rise office buildings have transformed the area around the suburban New Carrollton station, but a survey showed that only one percent of the workers employed there actually use the Metro. Moreover, little new residential construction has taken place in the vicinity of Metro stations. (Planning Magazine,1984)

V. Kreibich reported in Transportation magazine that the Munich Rapid Transit System "has had a major effect on the spatial structure of the region", characterized by "a strengthening of the service function of the city centre" (Kreibich,1978,p.137). North American proponents of rapid transit would point to this as proof of the success of the system. Kreibich, however, stated that this type of development "is not compatible with the objectives of either the state or the region." He argued that the radial structure of the rapid transit system favored the growth of the CBD at the expense of the suburban activity centres. This conflicted with the

City of Munich's development plan of deconcentration and decentralization. Moreover, Kreibich stated that, due to the rapid transit system, urban growth in the State of Bavaria has been focused within the Munich Region. This, too, ran counter to the State of Bavaria's plan of equal development of all regions. In the Transportation article Kreibich opposes the Munich Rapid Transit System for the very reasons that North American proponents support rail rapid transit. Both claim that rail rapid transit is capable of influencing urban development in a fashion which strengthens the CBD.

When San Francisco's Bay Area Rapid Transit system (BART) was constructed in the 1960's it was the United States' first major investment in rail transit in fifty years. Accordingly, major studies were commissioned to determine its impacts so that future decisions regarding rail transit investments could be made more knowledgeably. One of these studies was entitled Land Use and Urban Development Impacts of BART. This report did not simply calculate the value of new property development occurring in the vicinity of BART stations. Rather, developers, office tenants, and retail tenants were surveyed to find out what the determinants of location decisions actually were.

The surveys indicated that by 1979 BART had influenced the location of seven major projects within San Francisco's CBD. BART had contributed to a shifting of the location of new office construction toward Market Street. However, it was found that the improved accessibility offered by BART was not the direct cause; BART's major influence was indirect. First, BART construction spurred on the announcement of the government sponsored Market Street Development Project, a $35 million beautification effort. Second, new zoning provisions were adopted which granted floor area ratio bonuses

to buildings with direct entries to or located near a BART station. Both of these factors had an effect on developers' location decisions. Thus, BART's influence on the location of CBD development was primarily due to government policies rather than market forces (Dvett et al.,1979,p.81).

Most office tenants indicated that BART was a minor factor in their location decisions. BART was less important than site availability, price, and proximity to other firms. Retail tenants, on the other hand, almost completely disregarded BART in their location decisions.

The BART report goes on to suggest that BART has had more of an effect on behaviour patterns (such as shopping and workers' location preference) than on location decisions which affect the CBD real estate structure. The report concludes that

> BART clearly has not proven to be a sufficient condition to produce new office patterns, nor is it a necessary condition. Other cities must not expect a new transit system alone to solve development problems unless they are caused solely by correctable transportation deficiencies (Dvett et al.,1979,p.81).

2.4. Development Impacts of Light Rail Transit Systems

More than twenty North American cities have built or are committed to building an LRT system. In many of these cities the LRT has been planned as a component of a downtown redevelopment effort. (Cervero,1984a,p.140) In Buffalo, for example, the LRT is being viewed as a necessary factor for

downtown revitalization. Officials reported that during the first year of LRT construction more than $200 million worth of downtown development was undertaken or announced. Transit officials in Pittsburgh say that even before construction their new LRT system was a key factor in corporate decisions which led to $1.5 billion of building construction in the Golden Triangle within six years (Passenger Transport,1985).

In 1984, Robert Cervero, an Assistant Professor with the Department of City and Regional Planning of the University of California, Berkeley, studied both Edmonton's and Calgary's LRT systems for possible land use impacts. Focusing on population density and residential construction, Cervero was unable to find any evidence of an intensification of land development in Calgary. In Edmonton, Cervero found that "there have been virtually no new building activities around any of the outlying stations." (Cervero,1984b,p.14) He blamed this on unfortunate timing. At the insistence of local residents, a zoning freeze was placed around the outlying stations so that comprehensive station area planning could first be done. The zoning freeze coincided with a booming local economy, and a number of developers made development proposals. However, by the time the zoning freeze was removed, the petroleum-based economy had fallen into a recession and the proposals were put on hold. Cervero argued that, "because of the zoning freeze, the city failed to seize the opportunity to develop station areas when circumstances were most favorable" (Cervero,1984b, p.15). Cervero concluded that "LRT's impacts on densities, residential construction, and mixed-use development have been quite modest." It is important to note that he did not do any detailed analysis of the land use impacts in the vicinity of Edmonton's CBD station areas. He has suggested,

however, that "perhaps the strongest development potential of the LRT is in downtown areas" (Cervero, 1984a, p.146).

2.5. Implications of the Literature Review

The background information provided by the literature review has led to a focusing of the thesis topic. The specific interest of this study is whether or not Edmonton's LRT system has had an impact on land development within the CBD. Furthermore, the literature review has shown that the most conclusive method of measuring development impacts is to survey the individuals who were actually involved in CBD real estate and development.

3.0. METHODOLOGY

3.1. Chapter Summary

The methodology used in this study was to survey the owners and tenants of downtown buildings, asking the individuals who were directly involved what factors they considered when choosing their location. Developing an effective, non-biasing survey required an understanding of urban land economics. A model of land economics is discussed in this chapter, and from this model thirteen locational factors are identified. Once the survey was developed the next step was to collect the data. This process involved identifying buildings to include in the study, obtaining names and addresses of owners, and selecting tenants.

3.2. Research Methodology

This study uses a methodology similar to the one used in the BART report. Building owners are surveyed to find out directly from the source what the determinants of their location decisions were. Simply calculating how much development occurred near rapid transit stations, as was done in Washington, Pittsburgh, Buffalo, and Toronto, does not necessarily reveal the impact of rail rapid transit. The developers in these cities may have made their location decisions without regard to the transit station, in which case development may have occurred where it did whether or not the transit system was in existence.

Similarly to the BART report, this study includes a survey of the

tenants who occupy the buildings. This was done to provide a second point-of-view. Tenants' views are of interest to this study because their location decisions influence the developers' decisions. A developer will not construct a building in a certain location unless there is a perceived demand for space at that location. Since the success of a building depends on its ability to attract tenants, it is worthwhile to ask tenants why they located where they did.

3.3. Survey Development

The basic purpose of the survey was to obtain information directly from the individuals who made the location decisions. Those surveyed were asked whether or not their decisions were influenced by the LRT system. By compiling all of their responses, the survey reveals the extent to which the LRT has had an impact on land development in downtown Edmonton.

The development of an effective survey questionnaire required careful consideration. The goal was to develop a survey which would answer the question without leading the respondent to answer in a particular way. This latter requirement was essential to avoid biasing the results. To achieve this, the survey did not focus exclusively on the LRT. Instead, it included all of the major locational factors. This resulted in a survey which appears to be concerned with the importance of several locational factors rather than being specifically concerned with the impact of the LRT system. In addition, this provided extra information which is useful for determining the relative importance of the LRT system when compared with

the importance of other locational factors.

The survey questionnaire has three components. Part I consists of questions which provide general information about the building and its ownership. Part II lists fourteen locational factors and asks the respondent to indicate the importance of each factor to the land development in question. Part III consists of a number of short answer questions, giving the respondent an opportunity to provide details relevant to his land development.

Part II of the survey is designed so that the responses from all of the respondents can be cumulated to produce an overall picture. The respondents are asked to rate the importance of each of the fourteen locational factors on a scale from 0 (not important) to 5 (very important). The responses of all those surveyed are then compiled to produce a bar graph which illustrates the range and intensity of the importance of each factor.

Determining the locational factors to include in this section required an understanding of urban land economics. Economists Balchin and Kieve used the following model to explain the basics of urban land economics (Balchin and Kieve,1982,p.13). When comparing two sites within an urban area, the one with better accessibility will have a lower economic cost of personal contact associated with it. That is, the greater the accessibility, the lower is the average cost in money and time to travel to that site from all other sites within the urban area. The lower the economic cost of personal contact, the greater the comparative advantage of the site in terms of its ability to generate income. This in turn results in greater demand to locate at that site. Greater demand produces higher property value.

Finally, higher property value generates a greater intensity of development. This is because the owner of the site will attempt to maintain a certain rate of return from his investment. To compensate for the high property value, he must receive a greater income from the site. This is accomplished by increasing the rental rate and by increasing the rentable space, that is, by increasing the intensity of development. The conclusion drawn from this model is that within an urban area the spatial pattern of the intensity of land development is largely shaped by accessibility factors.

This information was used to identify nine locational factors related to accessibility. The first locational factor on the survey asks in a general way how important accessibility is to the land development. Respondents were asked to rank the importance of:

a. Being situated within the central area of the city.

Goodall, a geographer, states that the accessibility of a site is dependent on the relation of the site to the urban transport system (Goodall,1972,p.86). Knowing this, four locational factors were developed for the survey. Respondents were asked to evaluate the importance of being:

b. Accessible to major roadway links (automobile accessibility).
c. Accessible to a major surface transit corridor (bus accessibility).
d. Accessible to an LRT station.
e. Accessible to heavy pedestrian traffic (pedestrian accessibility).

A factor associated with automobile accessibility is the availability of parking. This led to the following locational factors:

f. Availability of convenient employee parking.
g. Availability of convenient customer parking

Different businesses have different reasons for requiring accessibility. For example, if a business requires a large customer base, then good accessibility is required so that customers may be drawn from the entire city population. Similarly, a business which requires a large supply of well-educated employees may also need to be accessible to a large population base. These ideas were used to develop two more locational factors for the survey. These were:

h. Accessible to the entire city population as a source of employees.
i. Accessible to the entire city population as a source of customers.

Cities are built to facilitate interaction among people and their activities. This need for personal contact is the cause of urban concentration. While accessibility factors are largely responsible for determining the overall pattern of the spatial intensity of development, complementary factors affect the location of individual developments. Complementary linkages tend to draw related activities close together (Goodall,1972,pp.85-89).

To determine the impact of complementary linkages on location decisions, the following factors were included in the survey:

j. Accessible to the downtown working population as a source of customers.
k. Nearness to other businesses / services (with whom frequent contact is made) (eg. banks, law courts, City Hall).
Name the businesses / services:

_____

l. Nearness to special amenities (eg. parks, view of the river valley).
Name the special amenities:

_____

m. Possession of a prestigious address.

The last factor, m., may not appear at first glance to be a complementary linkage. However, by reflecting on what makes an address prestigious, one realizes that it is the presence of prestigious businesses or institutions at that address. Those who are attracted to a location because of its prestigious address are actually taking advantage of the prestigious businesses or institutions that are located there. In this way these prestigious businesses or institutions are providing complementary linkages to the others.

The final factor listed in section two of the survey gives the respondent an opportunity to list and rank other locational factors that were not included in the questionnaire.

Part III of the survey consists of short answer questions. These questions give the respondent the opportunity to provide specific details. They also serve as logical checks within the survey. The same question is

asked more than once, but in different ways, to see if answers are consistent. One problem with subjective surveys such as this is that they force people to rationalize their decision-making, something they may not have actually done at the time the decision was made. Having logical checks within the survey is a way of ensuring the validity of the responses.

The following questions were asked in Part III of the survey:

- "Of the above factors b. to n., which is the most important? Why?" This question was included to see if the LRT system was, on its own, the most important inducement causing land development to occur where it did. It serves as a logical check to the responses given in the second component of the questionnaire. Logically, none of the other logical factors should be ranked higher than the factor chosen as the most important.

Respondents were asked to choose only among the factors b. to n. Factor a., importance of being situated within the central area of the city, is too general, since all of the other factors are in some way incorporated in this factor.

- "Is this the ideal location for this building? If yes, why? If not, what site would be a better location, and why?" This question was included for two reasons. First, it identifies the premium location within the CBD. Second, it reveals whether or not access to the LRT system was considered to be an important component of an ideal location.
- "Did planning requirements / concessions (eg. Floor/area ratio, height restriction, parking spaces) have an effect on the choice of location for your development? If yes, how?" The purpose of this question was to determine the importance of government policies in the land development process.

- "Which financial institution provided the financing for this development?" It was originally planned to survey the financial institutions which provided funding for the land developments. The purpose of this question was to obtain a mailing list for the survey. Unfortunately, not enough information was obtained, so financial institutions were not surveyed.
- "If the LRT stations had been located at a greater distance from this site: a) Would the success of your real estate be affected? Why or why not? b) Would you still have purchased this site? Why or why not? (If you are the original owner, would you still have redeveloped this site? Why or why not?" These questions were used to find out whether or not the LRT system was a necessary, if not sufficient, factor for influencing the location of land development. A necessary factor is one which is required for a development to be induced to locate in a certain location, provided other favorable factors are also present. A sufficient factor is one which will, on its own, induce a development to locate in a certain area.

These questions serve as an additional logical check. If the respondent indicated in part two that the LRT was somewhat important or very important, then the success of the development should be affected by being located at a greater distance from an LRT station.

After receiving the early responses from the land developers, it was found that there were difficulties with the last question. Respondents tended to answer part (b) as if it was a completely new question having nothing to do with the LRT. Accordingly, it was clarified for the tenant questionnaire as follows: "If the LRT stations had been located at a greater distance from this site, would you still have chosen to locate your

business / office in this building? Why or why not?"

Another question was added to the tenant questionnaire after reviewing the early responses to the owner questionnaire. This was: "Why did you locate your business / office in this building?" This was an obvious question which was originally overlooked. It allows the respondent to discuss how the decision was made without being forced to rationalize the decision-making within a specific framework (as was done in Part II of the survey).

3.4. Data Collection

The first step in the data collection procedure was to determine which buildings belong in the study. To this end, two criteria were established. First, the building had to be located in the CBD. Edmonton's CBD is bounded to the west and north by railways, and to the south by the river valley. There is no physical boundary to the east. However, the land use beyond 96 Street is primarily residential rather than commercial so 96 Street was chosen as the eastern boundary.

The second criterion for the inclusion of buildings in the study was the year of their construction. The intent was to include all of the buildings which may have been influenced by the LRT system. In land development decisions locational factors which will be present in the near future are as important as present factors. Buildings which were built during the LRT planning stages were as likely to be affected by the LRT system as those built during LRT construction or later. Serious LRT

planning began in the period from 1972 - 1974, and construction began in September, 1974. Therefore all buildings constructed since this period were included in the study.

Once the criteria were established, the next step was to identify the buildings which fit the criteria. A current CBD real estate map was obtained from Royal LePage Real Estate. This map identified the name and location of all the existing buildings in downtown Edmonton. However, the dates of their construction were not included on the map. To identify the buildings which were constructed since the early LRT planning stages, two sets of aerial photographs were obtained: a 1984 set from the City of Edmonton Transportation Department and a 1972 set from the City Archives. 1974 photographs would have been preferred, but only 1972 photographs were available. The 1972 and 1984 photographs were then compared city block by city block. Buildings which appeared on the 1984 photographs but not on the 1972 photographs were recorded on the Royal LePage real estate map. This information was then transferred to the new map shown in Figure 3.1.

The second major step in the data collection procedure was to determine the names and addresses of the developers of these buildings. It was hoped that this information could be obtained from historical records at the City Tax Assessor's Office. Unfortunately, the Tax Assessment Department only maintains up-to-date information. When a building's ownership changes hands the Tax Assessor updates the information and deletes the old information.

Consequently an alternative method of obtaining the names of the developers was used. Using the information made available by the Tax Assessors, the names and addresses of the present owners were obtained. An

additional question was included in the survey sent to present owners. This was, "who was the original owner of this building?". 76% of the present owners turned out to also be the original owners. Unfortunately, most of those who were not the original owner did not provide the desired information.

The third step in the data collection procedure was to select the building tenants to be surveyed. Not all tenants could be surveyed due to their large number. Consequently, a method of selecting a manageable yet still meaningful number had to be created.

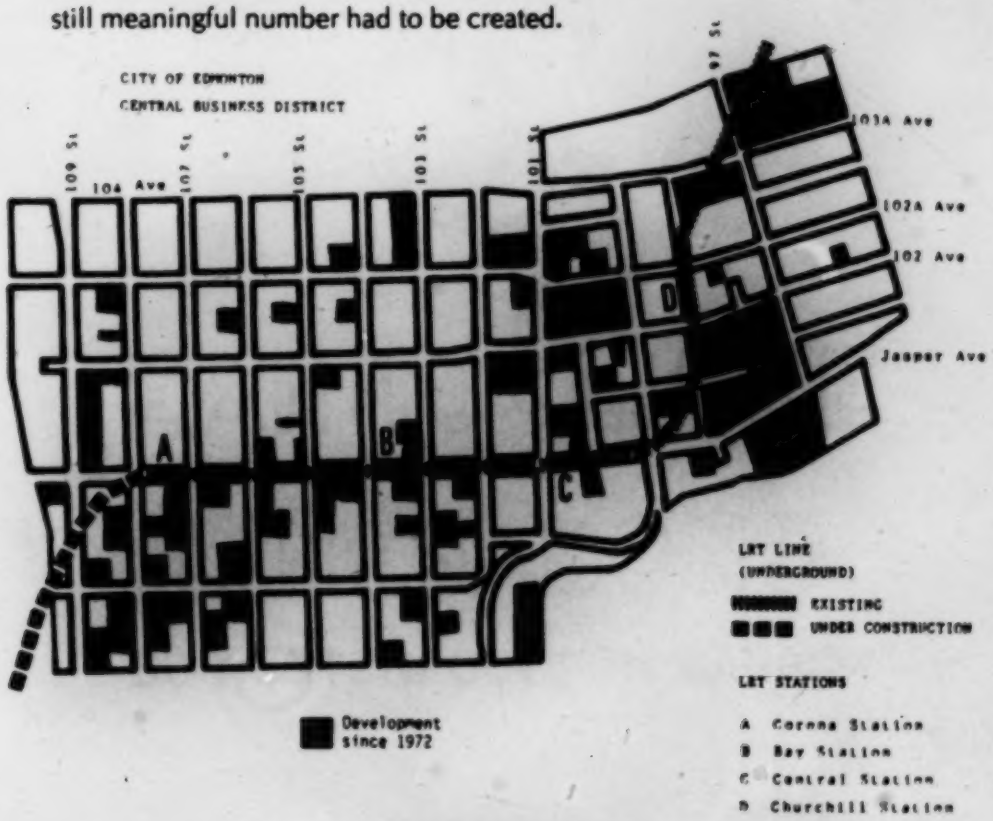

Figure 3.1 New Development in Edmonton's CBD Between 1972 and 1986

The rationale for surveying tenants was that the success of a land development depends on its ability to attract tenants. The larger the tenant, in terms of the amount of floor space rented, the greater is that tenant's impact on the success of the development. Therefore, the reasons that a large tenant is attracted to a building are more important than those of a small tenant.

It was intuitively assumed that different types of tenants had different reasons for locating in a specific building, even though their separate reasoning brought them to the same location. Therefore, two broadly defined categories of tenants were considered: retail/service tenants, and office tenants.

Thus, the criteria for selecting tenants for inclusion in the study were size and type. The largest retail/service tenant and the largest office tenant were selected from each building. Additional office tenants were included depending on the size of the building; one more tenant was selected for every fifteen stories. That is, a building less than fifteen stories high would have one office tenant selected, a building less than thirty stories high but at least fifteen stories high would have two office tenants selected, and so on.

Not all buildings had their tenants surveyed. Tenants of owner occupied buildings were already surveyed through the owners survey. The tenants of residential buildings were not surveyed because the questionnaires were designed for the work environment rather than the home environment.

The 1984-85 edition of Henderson's Directory (Henderson's Directory, 1984-85) was used to identify the building tenants and their approximate floor space, measured in the number of floors occupied. Site inspection was used for the newer buildings whose tenants were not listed in Henderson's Directory.

3.5. Survey Response

A total of 77 buildings fit the criteria for inclusion in this study. Of the 77 surveys mailed out to building owners there were 52 replies, resulting in a response rate of 67%. In addition to the building owners, 93 tenants were surveyed. 54 tenants replied, giving a response rate of 58%.

4.0. DATA ANALYSIS

4.1. Chapter Summary

The objective of this chapter is to determine from the survey data whether or not the LRT system was important to land development decisions in Edmonton. A secondary objective was to determine to whom the LRT is important. The data collection procedure from the previous chapter produced a large volume of data. In this chapter the data is transformed into meaningful information and interpreted. Three techniques of analysis are employed. These are classification, graphic presentation, and statistical comparison. An IBM PC-AT microcomputer was used for all three techniques. Lotus 1-2-3 software was used to perform the computations.

4.2. Analytical Methods

Data analysis may be defined as "the ordering and structuring of data to produce knowledge" (Howard and Sharp,1983,p.99). With this in mind, the purpose of this chapter was to accomplish two objectives. The first objective was to transform the raw data, as compiled in the Appendix, into meaningful information. The second objective was to interpret the information.

Three main techniques were used in this study to order and structure the data. The first technique used was classification. This involves the

division of a large set of data into smaller sets of related data. In this study the survey respondents were classified into categories according to characteristics such as distance from the LRT stations, building value, building age, and building ownership. The purpose of classification is to discover whether or not different categories of respondents place a different importance on accessibility to the LRT.

The second technique used to order and structure the raw data was to reduce a set of data into a single descriptive statistic. This facilitates the comparison of a number of sets of data by allowing a single figure represent an entire group of numbers. The finer details of the data become lost or hidden, but in their place new information is created.

The third technique was to produce graphic information. A graph is a visual representation of data. Comparisons of data sets become much more meaningful when seen in a graphic presentation as opposed to a table of numbers.

4.3. Data Organization

Table 4.1 outlines the classifications which were used to divide the respondents of the owners' survey into categories.

OWNERS	CLASSIFICATION	CATEGORY
	Building type:	- office
		- residential
	Distance:	- Zones 1 - 5 (Figure 4.1)
	Building value:	- < $5 million
		- 5 - 10 million
		- 10 - 30 million
		- > $30 million
	Building age:	- 1972 - 1974
	(year of	- 1975 - 1978
	construction)	- 1979 - 1982
		- 1983 - 1986
	Ownership:	- original owner
		- new owner

Table 4.1 Classification Groups of Owners

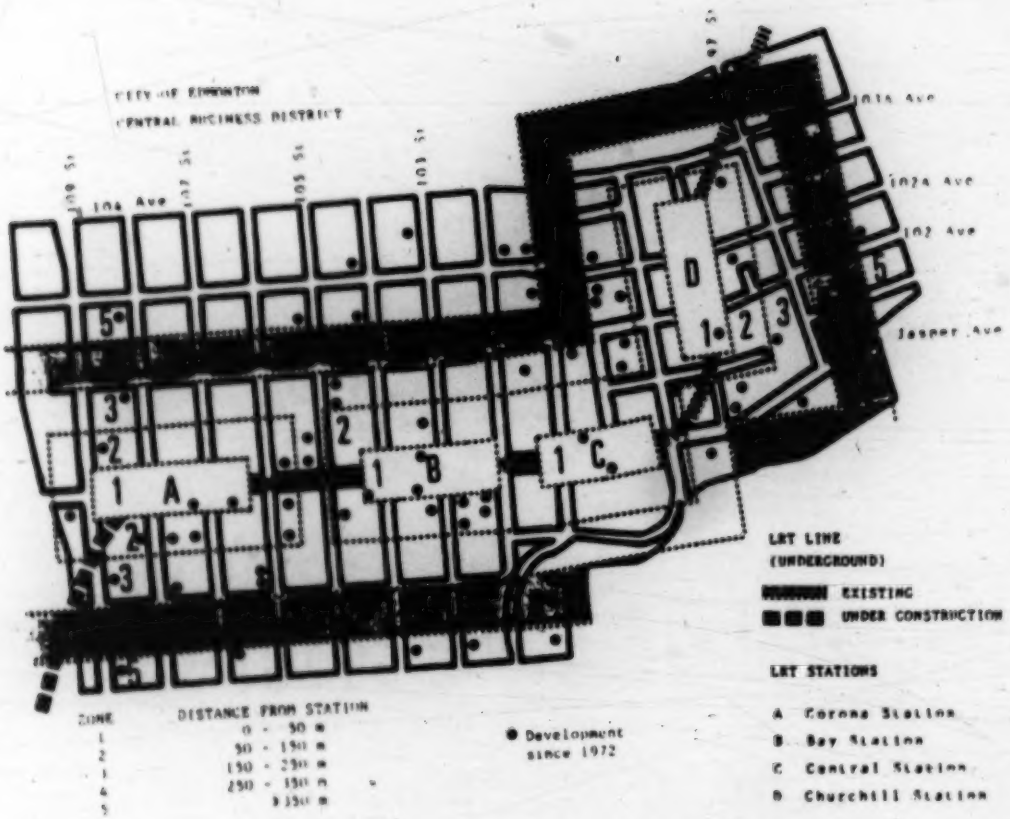

Figure 4.1 Distance of New Developments from LRT Stations

Table 4.2 outlines the classifications which were used to divide the respondents of the tenants' survey into categories.

TENANTS	CLASSIFICATION	CATEGORY
	Tenant type:	- business - provincial government - retail / service
	Distance:	- Zones 1 - 5 (Figure 4.1)

Table 4.2 Classification Groups of Tenants

Two descriptive statistics were used in the analysis of Part II of the survey:

1. Average response for the LRT.
2. Relative importance of the LRT.

The average response for the LRT indicates the importance of the LRT on a scale of 0 to 5. The relative importance of the LRT compares the average response for the LRT to the average response for all of the other locational factors listed in Part II of the survey. This figure was determined by calculating the average response for all 11 of the other locational factors (not including factor a., central city, which was a general factor) and then subtracting this figure from the average response for the LRT. If the LRT is above average in importance this statistic will

be positive. If the LRT is below average in importance this statistic will be negative.

Data from Part II of the survey was used to compare the importance of the LRT with the importance of a variety of other locational factors. In contrast, the responses from Part III of the survey reveal what impact the LRT actually had, if any, on the decision of choosing a location. Both parts of the survey have value to this study. Part III gives a direct indication of the importance of the LRT to land development decisions in Edmonton. Part II produces a theoretical estimation of how owners and tenants will react to the construction of an LRT system.

An IBM PC-AT microcomputer was used to organize and manipulate the data, using Lotus 1-2-3 software. This software was also used to produce the graphs. Lotus 1-2-3 proved to be a very worthwhile tool for organizing and manipulating the data base.

4.4. Data Presentation

This section presents the data from the owners survey, followed by the data from the tenants survey. The first table in each of these subsections compares the overall ranking of each of the thirteen locational factors listed in Part II of the survey. This provides a direct comparison of the ranking of the LRT with the ranking of the other factors. This overview is followed by a more detailed analysis of the LRT data. A series of graphs displays for each category of respondent the average ranking of the LRT and the relative importance of the LRT. The data that form these tables and graphs are contained in the Appendix.

4.4.1. Owners

Overall Ranking of the Thirteen Locational Factors:

The overall ranking of the thirteen locational factors listed in Part II of the survey is shown in Table 4.3. As expected, the downtown building owners ranked "being situated within the central area of the city" the highest of the thirteen factors. Three of the next four most highly ranked factors corresponded to the major modes of transportation available in Edmonton. Automobile accessibility was the most important of the three, followed closely by bus accessibility. The ranking of the LRT trailed the other two, but was still given the fifth highest score overall.

Overall Ranking	Locational Factor	Average Importance (Scale of 0 - 5)
1	Central Area of the City	4.33
2	Automobile Accessibility	3.92
3	Bus Accessibility	3.83
4	Nearness to Other Businesses	3.80
5	LRT Accessibility	3.37
6	Convenient Customer Parking	3.29
7	Pedestrian Accessibility	3.17
8	City-wide Source of Customers	3.12
9	Downtown Source of Customers	3.08
10	Convenient Employee Parking	3.02
11	City-wide Source of Employees	2.98
12	Prestigious Address	2.48
13	Nearness to Special Amenities	2.35

Table 4.3 Downtown Building Owners' Overall Ranking of the Thirteen Locational Factors

It is interesting to note that the bus system is more important to owners than the LRT system, despite the LRT's apparent advantages. The LRT system is a higher form of public transit than the bus system, with potentially a much greater corridor capacity. The permanency of the LRT's fixed route offers security compared to the uncertainty of the exact location of future bus routes. The LRT system also has a higher profile than the bus system. Nevertheless, the relative ranking of the three modes, automobile, bus, and LRT, is consistent with their actual usage, as measured by the CBD screenline counts presented in Table 1.2 in the Introduction.

LRT Average and Relative Importance:

Respondents to the owner survey gave the LRT an average ranking of 3.37, which places the LRT between "somewhat important" and "very important" on the scale from 0 to 5. This reveals that building owners do not look upon the LRT with great enthusiasm, yet they do concede that it is worthy of some consideration. The relative importance of the LRT was 0.18, suggesting that the impact of the LRT on land development decisions was slight.

Owners Classifications:

Owners: Building Type:

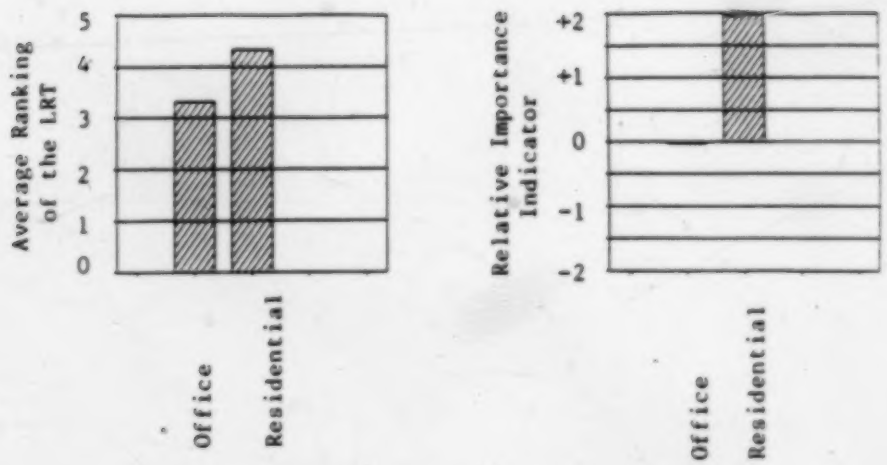

Figure 4.2 Survey Responses of Owners, Categorized by Building Type

Residential building owners placed far more importance on the LRT than did the office building owners, ranking the LRT a full point higher (4.33 versus 3.32). The relative importance indicator magnified the importance that residential building owners attach to the LRT. At 1.95, no other category came close to placing as much importance on the LRT. Office building owners, in contrast, gave the LRT a relative importance of -0.02. This suggests that office building owners did not consider the LRT to be a very important locational factor.

Owners: Distance from the LRT:

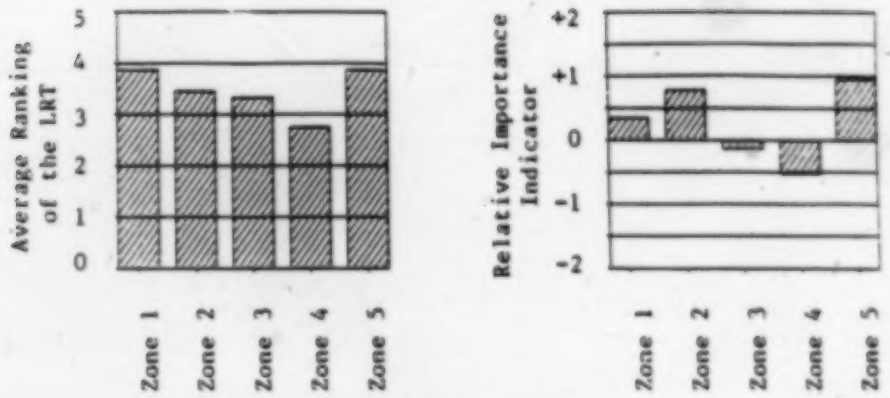

Figure 4.3 Survey Responses of Owners,
Categorized by Zone (See Figure 4.1)

Theory and common sense dictate that the importance of the LRT should decrease as distance from the LRT increases. This is indeed the case in this study, as the average ranking of the LRT decreases as one progresses from Zone 1 to 4. Curiously though, this trend reverses in Zone 5, which ranks the LRT even higher than Zone 1. This suggests that the LRT is ranked differently by various categories of respondents and that one of the categories which ranks the LRT highly is concentrated in Zone 5. In fact, residential buildings are primarily situated in Zone 5. As previously discussed, residential building owners ranked the importance of the LRT very highly.

The relative importance of the LRT does not show any trend with

respect to distance. It does, however, confirm the importance of the LRT to Building owners in Zone 5. This again is due to the concentration of residential buildings in Zone 5.

Owners: Building age:

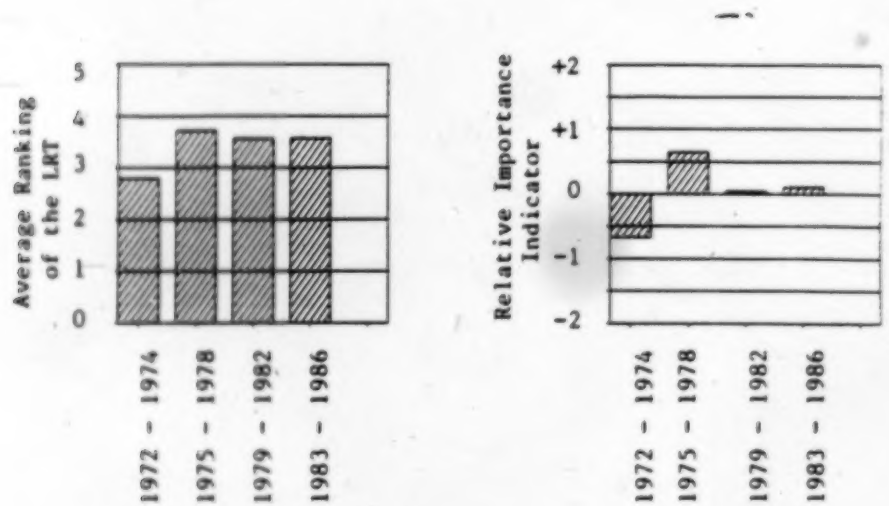

Figure 4.4 Survey Responses of Owners, Categorized by Building Age

Owners of buildings which were constructed prior to the construction of the LRT placed the least importance on the LRT. The LRT was most important to owners whose buildings were constructed at the same time the LRT was being constructed (1975 - 1978).

Owners: Building Value:

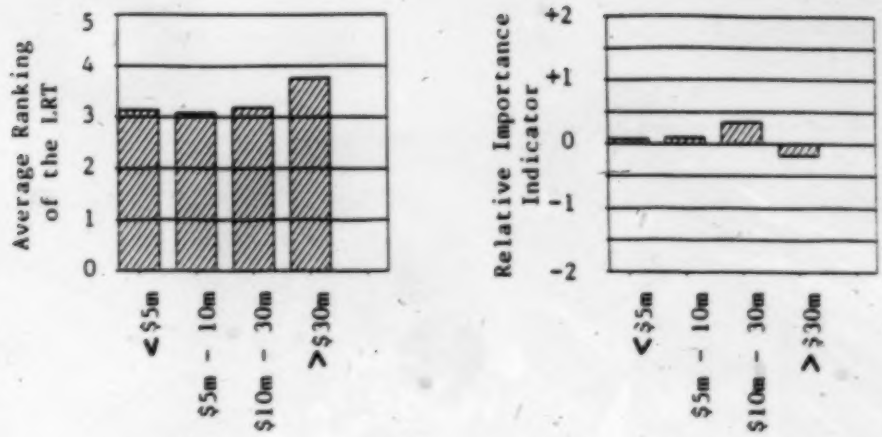

Figure 4.5 Survey Responses of Owners, Categorized by Building Value

Access to the LRT is significantly more important to owners whose buildings are valued over $30 million than to owners whose buildings are valued less than $30 million. However, the opposite is true in regard to the relative importance of the LRT, where owners of buildings valued over $30 million were the only category with a negative value. This apparent contradiction suggests that while the >$30 million building owners ranked the LRT higher, they also ranked several of the other locational factors higher than did the other building owners.

Owners: Ownership (Original/Non-original):

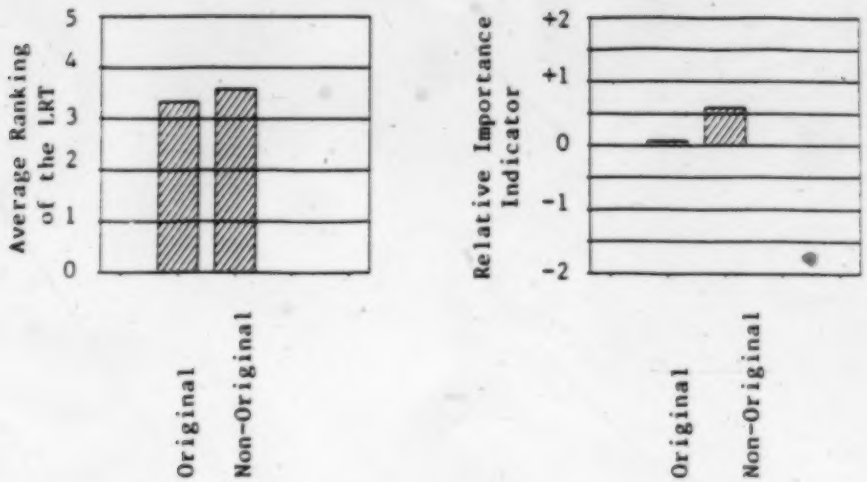

Figure 4.6 Survey Responses of Owners,
Categorized by Ownership (Original/Non-original)

The LRT is more important to those who were not the actual developers of the building. This is interesting because it suggests that the non-original building owners are more concerned with the locational amenities of a site than are the developers. However, if the LRT is to have an impact on land development then obviously it must have an impact on the developers.

4.4.2. Tenants

Overall Ranking of the Thirteen Locational Factors:

The overall ranking of the thirteen locational factors listed in Part II of the survey is shown in Table 4.4. The downtown tenants ranked "being situated within the central area of the city" the highest of the thirteen locational factors, as did the building owners. However, there are significant differences after this. The second highest ranked factor was the "availability of convenient employee parking", which corresponds to their desire for convenient automobile access. Automobile accessibility and bus accessibility were tied at fourth in the overall ranking. The LRT only ranked tenth. As in the owners survey, the relative ranking of the two components of the public transit system, bus and LRT, corresponds to their actual usage. However, the ranking of bus accessibility was very favorable compared to the ranking of automobile accessibility. This suggests that employers recognize the importance of public transit to their employees.

Overall Ranking	Locational Factor	Average Importance (Scale of 0 - 5)
1	Central Area of the City	3.98
2	Convenient Employee Parking	3.70
3	Nearness to Other Businesses	3.66
4	Automobile Accessibility	3.04
4	Bus Accessibility	3.04
6	Convenient Customer Parking	2.86
7	Downtown Source of Customers	2.64
8	City-wide Source of Customers	2.35
9	City-wide Source of Employees	2.34
10	LRT Accessibility	2.30
11	Pedestrian Accessibility	2.10
12	Prestigious Address	2.06
13	Nearness to Special Amenities	1.10

Table 4.4 Downtown Building Tenants' Overall Ranking of the Thirteen Locational Factors

LRT Average and Relative Importance:

Respondents to the tenant survey ranked the LRT significantly lower than the respondents to the owner survey. At 2.30, the average ranking of the LRT is situated at the lower end of "somewhat important" on the scale from 0 to 5. The relative importance of the LRT was -0.33, indicating that accessibility to the LRT was less important to tenants than a number of other locational factors.

Tenants Classifications:

Tenants: Tenant type:

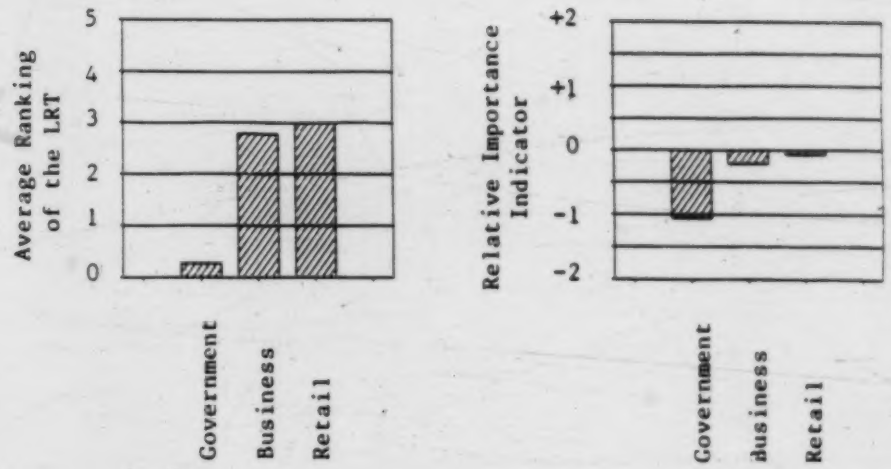

Figure 4.7 Survey Responses of Tenants, Categorized by Tenant Type

The most striking revelation in this classification is the absolute unimportance of the LRT to provincial government tenants. This is shown in both the average ranking of the LRT (0.27) as well as the relative importance of the LRT (-1.06). The LRT is somewhat important to the other tenants, but the relative importance indicates that several other locational factors are more important.

Tenants: Distance from the LRT:

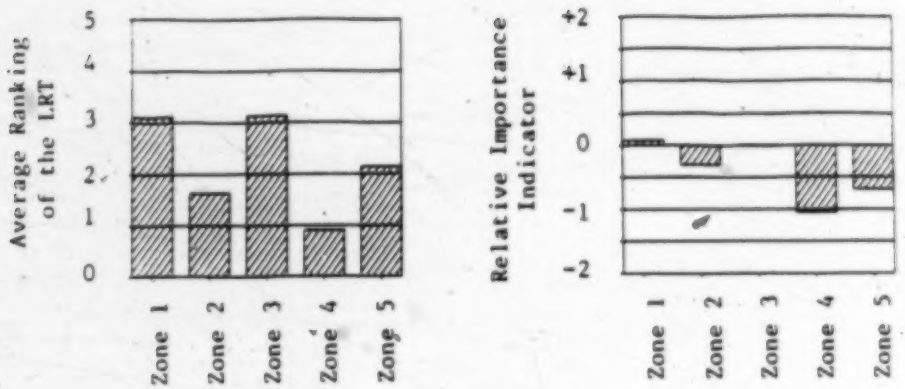

Figure 4.8 Survey Responses of Tenants,
Categorized by Zone (See Figure 4.1)

No trend is revealed. This indicates that the importance of the LRT depends more on the type of tenant than on the distance of the tenant from the LRT. A large proportion of the tenants in Zones 2 and 4 are provincial government tenants, who ranked the LRT very low in importance.

4.5. Data Interpretation

The following conclusions can be drawn from the data obtained in Part 2 of the survey. The LRT is recognized as an important mode of transportation providing accessibility to the CBD, yet it is not considered to have a major impact on CBD real estate. The generally low figures for the relative importance of the LRT indicate that the LRT had little impact on development decisions. Consequently, it can be concluded that the LRT did not have an important impact on urban form in Edmonton's CBD.

Reasons for the LRT's lack of importance are revealed in comments made by building owners throughout Part 3 of the survey. Respondents repeatedly commented that while public transportation is an asset, the current LRT system is incomplete and therefore relatively unimportant. One respondent stated that "close proximity to public transportation is a marketing tool. It enhances the building and its location." A residential respondent wrote that the "LRT makes it possible to live in this building and work anywhere in the downtown." However, one owner commented that the "LRT does not serve the whole city so it is currently ineffective." Another owner said that "the LRT is not presently an important means of transportation for the city". While one building owner mentioned that "an immediately adjacent station will always be a benefit", another bluntly stated that the LRT "has no measurable effect on success. Investment decisions are not made on such a minor transportation mode in Edmonton. Edmonton's LRT is no different

than a well travelled bus route". In fact, the LRT is used for 7% of the AM peak hour trips to the CBD, which is far more than any single bus route in Edmonton.

Nevertheless, building owners foresee future benefits. One owner wrote that the "LRT is not a major factor today. However it will become more and more important with time." Another owner stated that "as the LRT system matures and extends to other areas of the city it will become a real bonus to this development. At present, it is a modest convenience". Another comment was that "although the LRT is at a youthful stage it will become increasingly important to our success, as traditionally in other cities the strongest real estate is that located close to the subways".

Only one respondent indicated that the LRT had directly influenced the location of the building. The respondent wrote that "closeness to an LRT station was an important reason for selecting this site, and encouraging the use of the LRT was one of the City objectives which we supported." Significantly, this building is government-owned so commercial success was not the first priority in determining location.

The LRT had almost no influence on tenants' choice of location. Only one respondent indicated that their decision to locate where they are was dependent on access to the LRT, explaining that the "LRT gives us core advantages that other buildings do not have." Another tenant was not primarily influenced by the LRT, but nevertheless considered the LRT to be an important factor. This tenant wrote that "the location of LRT stations and public transportation access would have a major influence if two similar properties were available." Two tenants commented that the LRT is a convenience but not a necessity. Two other tenants wrote that the LRT was

presently unimportant because it does not yet provide full coverage within the city.

The majority of tenants indicated that the LRT did not influence their choice of location with comments such as "the LRT is not important to our business", "the LRT was not a factor in the choice of site", and "it would have no effect wherever the LRT was situated."

5.0. CONCLUSION

The primary objective of this study was to determine if the LRT has affected land development in Edmonton's CBD. As revealed in the review of the literature on the subject, many unsubstantiated statements have been made about the ability of rapid transit to generate and shape land development in cities.

In order to uncover the true impact of the LRT on land development in Edmonton, the people who were directly involved in Edmonton's downtown development were surveyed with written questionnaires. There was a very strong response rate of 67% from the building owners. Building tenants were also surveyed to provide secondary information. Since developers build office and retail space to attract tenants, determining the locational influences acting on tenants is important. The response rate of tenants, 58%, was also very strong.

The purpose of the written questionnaire was to determine if building owners and tenants were influenced in their choice of location by the location of the LRT stations. The questionnaire was concerned with all locational factors and therefore did not lead the respondents to answer in a particular way.

The most significant finding of this study is that the LRT was not ranked highly in importance relative to the ranking of many other locational factors. This reveals that the LRT did not have a strong impact on land development in Edmonton's CBD. In fact, only one major development was directly influenced by the LRT. A location close to an LRT station was

chosen for this government-owned development in order to encourage the use of the LRT and to provide the building tenants with convenient transportation.

While only one development was directly influenced to locate near the LRT, the surveys revealed several categories of building owners which were not influenced but nevertheless placed importance on accessibility to the LRT. The most notable were residential building owners, who ranked the LRT higher than did any other group of owners or tenants. These owners felt that the accessibility offered by the LRT was very important to their residents, many of whom do not own an automobile. The LRT is important to the residential building owners because they want to attract tenants to their buildings.

The survey also indicated that accessibility to the LRT was most important to building owners whose buildings were constructed during the same period that the LRT was constructed. This suggests that, having heard reports about land use impacts of rapid transit in other cities, these developers were hoping that the same impacts would occur in Edmonton. Once the LRT was operating the developers showed less interest in the system, perhaps because it did not live up to expectations.

In addition to showing which groups of survey respondents felt positively about the LRT, the survey also identified groups of respondents which felt the LRT was not important. Office and retail tenants placed very little importance on the LRT to the success of their business, and were therefore not influenced in their choice of location by the LRT. The provincial government administration is the most significant group in this category. It is also the single most important leaseholder of downtown

office space in Edmonton. If accessibility to the LRT had been an important factor in their location decisions then it is likely that the LRT would have had a greater impact on downtown development. However, the provincial government administration tenants based their location not on accessibility to the LRT but on the complementary factor of being close to other provincial government offices and on the availability of parking. Convenient parking is especially important to provincial government employees because their employer subsidizes the cost of parking.

It was learned through the written comments of the respondents that the incompleteness of the LRT system has been a crucial factor in its inability to influence land use. It currently serves only the north east quadrant of the city. It has not radically altered the pattern of accessibility in downtown Edmonton. In fact, the automobile has increased its share of ridership to the downtown since the time the LRT began operating. This can be attributed to the growth in the number of parking stalls in the downtown area which has resulted in an abundance of inexpensive parking.

In conclusion, this study has found that the LRT system has not played a significant role in shaping the spatial pattern of land development in downtown Edmonton. Moreover, no evidence was found to suggest that the LRT system attracted new high density development into the CBD. The findings of this thesis demonstrate that transportation planners and politicians cannot expect rail rapid transit to strengthen and revitalize their city's CBD on its own, without the assistance of other supporting policies. The decision to construct a rail rapid transit system should be based on transportation factors rather than on anticipated land use impacts.

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APPENDIX

Survey and Correspondence Mailed to Building Owners

SURVEY

Name of Building: _____

Address of site : _____

_____

_____

_____

1. Name and Business Address of respondent:

_____

_____

_____

_____

2. Phone number: _____

3. In what year was this site redeveloped? _____

4. Who was the original owner (developer) of this building?

_____

Address: _____

_____

_____

Phone Number: _____

5. How do the following locational factors rate in importance to the success of your real estate holding?

SCALE:	Not Important 0	1	Somewhat Important 2	3	Very Important 4	5	Circle your response
a. Being situated within the central area of the city.							0 1 2 3 4 5
b. Accessible to major roadway links (automobile accessibility).							0 1 2 3 4 5
c. Accessible to a major surface transit corridor (bus accessibility).							0 1 2 3 4 5
d. Accessible to an LRT station.							0 1 2 3 4 5
e. Accessible to heavy pedestrian traffic (pedestrian accessibility).							0 1 2 3 4 5
f. Availability of convenient employee parking.							0 1 2 3 4 5
g. Availability of convenient customer parking.							0 1 2 3 4 5
h. Accessible to the entire city population as a source of employees.							0 1 2 3 4 5
i. Accessible to the entire city population as a source of customers.							0 1 2 3 4 5
j. Accessible to the downtown working population as a source of customers.							0 1 2 3 4 5
k. Nearness to other businesses / services (with whom frequent contact is made) (eg. banks, law courts, City Hall). Name the businesses / services. _____							0 1 2 3 4 5
l. Nearness to special amenities (eg. parks, view of the river valley). Name the special amenities: _____							0 1 2 3 4 5
m. Possession of a prestigious address.							0 1 2 3 4 5
n. Other locational factors: _____							0 1 2 3 4 5

6. Of the above factors b. to n., which is the most important? Why?

7. Is this site the ideal location for this building? If yes, why? If not, what site would be a better location, and why?

8. (Answer this question if you are the original owner / developer.) Did planning requirements / concessions (eg. Floor/area ratio, height restriction, parking spaces) have an effect on the choice of location for your development? If yes, how?

9. (Answer this question if you are the original owner / developer.) Which financial institution provided the financing for this development?

_____

Address: _____

_____

_____

Phone Number: _____

10. If the LRT stations had been located at a greater distance from this site:

a) Would the success of your real estate be affected? Why or why not?

_____

_____

_____

_____

_____

_____

_____

b) Would you still have purchased this site? Why or why not? (If you are the original owner, would you still have redeveloped this site? Why or why not?)

_____

_____

_____

_____

_____

_____

_____

University of Alberta
Edmonton

Department of Civil Engineering

Canada T6G 2G7

220 Civil/Electrical Engineering Building
Telephone (403) 432-4235

Dear Sir/Madam:

This letter serves to introduce Bill Sabey, who is a graduate student attending the University of Alberta. Bill is carrying out a survey in order to obtain data for his thesis. I would appreciate it very much if you would take the time to complete this questionnaire and return it using the envelope provided.

Your business is located in a downtown real estate holding which has been redeveloped within the past fifteen years. The name and address of the building in question is indicated at the top of the first page of the survey.

The purpose of this project is to improve our understanding of the importance of locational variables to the downtown real estate market and the effect of these variables on land redevelopment. The survey intends to determine the locational benefits associated with the site which promoted its redevelopment. Therefore it is important to have this questionnaire answered (if possible) by someone who was involved in making the decision to locate your business here.

If you have any questions or difficulties with the questionnaire please contact Bill at 488-6532.

Survey responses will be kept anonymous.

Thank you for your cooperation and assistance.

Sincerely,

J.J. Bakker
Professor
Department of Civil Engineering

JJB/mm
Encl.

University of Alberta
Edmonton

Department of Civil Engineering

Canada T6G 2G7

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Telephone (403) 432-4235

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You are the owner of downtown real estate which has been redeveloped within the past fifteen years. The name and address of the building in question is indicated at the top of the first page of the survey.

The purpose of this project is to improve our understanding of the importance of locational variables to the downtown real estate market and the effect of these variables on land redevelopment. The survey intends to determine the locational benefits associated with the site which promoted its redevelopment. Therefore it is important to have this questionnaire answered (if possible) by someone who was involved in making the decision to redevelop (or purchase) this real estate.

If you have any questions or difficulties with the questionnaire please contact Bill at 488-6532.

Survey responses will be kept anonymous.

Thank you for your cooperation and assistance.

Sincerely,

J.J. Bakker

J.J. Bakker
Professor
Department of Civil Engineering

JJB/mm

Dear Sir/Madam:

This correspondence serves as endorsement by the Downtown Parking Advisory Board of the research project being undertaken by Mr. Sabey of the Department of Civil Engineering - University of Alberta.

Since the results of the survey will be available to the Downtown Parking Advisory Board, and because we are sincerely interested in determining the concerns of owners and developers as they relate to downtown parking, we urge you to take the time necessary to complete the survey.

Sincerely yours,

J. Charuk
Chairman
Downtown Parking Advisory Board

JC.gs/23

Survey and Correspondence Mailed to Building Tenants

SURVEY

Name of Building: _____

Address of site : _____

_____

1. Name and Business Address of respondent:

_____

_____

_____

_____

2. Phone number: _____

3. In which of the following categories do you belong?

Retail / Service _____

Business Office _____

Municipal Government _____

Provincial Government _____

Federal Government _____

Other (specify) _____

_____

4. How do the following <u>locational</u> factors rate in importance to your business?

	Not Important		Somewhat Important		Very Important		Circle your response
SCALE:	0	1	2	3	4	5	
a. Being situated within the central area of the city.							0 1 2 3 4 5
b. Accessible to major roadway links (automobile accessibility).							0 1 2 3 4 5
c. Accessible to a major surface transit corridor (bus accessibility).							0 1 2 3 4 5
d. Accessible to an LRT station.							0 1 2 3 4 5
e. Accessible to heavy pedestrian traffic (pedestrian accessibility).							0 1 2 3 4 5
f. Availability of convenient employee parking.							0 1 2 3 4 5
g. Availability of convenient customer parking.							0 1 2 3 4 5
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j. Accessible to the downtown working population as a source of customers.							0 1 2 3 4 5
k. Nearness to other businesses / services (with whom frequent contact is made) (eg. banks, law courts, City Hall). Name the businesses / services. _____							0 1 2 3 4 5
l. Nearness to special amenities (eg. parks, view of the river valley). Name the special amenities: _____							0 1 2 3 4 5
m. Possession of a prestigious address.							0 1 2 3 4 5
n. Other locational factors (name them): _____							0 1 2 3 4 5

5. Of the above factors b. to m., which is the most important? Why?

6. Why did you locate your business / office in this building?

7. Is this site the ideal location? If yes, why? If not, what site would be a better location, and why?

8. If the LRT stations had been located at a greater distance from this site, would you still have chosen to locate your business / office in this building? Why or why not?

University of Alberta
Edmonton
Canada T6G 2G7

Department of Civil Engineering
220 Civil/Electrical Engineering Building
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February 14, 1986

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If you have any questions or difficulties with the questionnaire please contact Bill at 488-6532.

Survey responses will be kept anonymous.

Thank you for your cooperation and assistance.

Sincerely,

J.J. Bakker
Professor
Department of Civil Engineering

JJB/mm

University of Alberta
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Thank you for your cooperation and assistance.

Sincerely,

J.J. Bakker
Professor
Department of Civil Engineering

JJB/mm
Encl.

Dear Sir/Madam:

This correspondence serves as endorsement by the Downtown Parking Advisory Board of the research project being undertaken by Mr. Sabey of the Department of Civil Engineering - University of Alberta.

Since the results of the survey will be available to the Downtown Parking Advisory Board, and because we are sincerely interested in determining the concerns of owners and developers as they relate to downtown parking, we urge you to take the time necessary to complete the survey.

Sincerely yours,

J. Charuk
Chairman
Downtown Parking Advisory Board

JC.gs/23

Owners' Survey Responses

- Raw Data -

Year	type	9.0a	b	c	d	e	f	g	h	i	j	k	l	a	n	6	7	8	10a	10b	Zone	Land Appraisal	Bldg Appraisal
1976	oth	y	4	4	5	4	5	4	5	4		5	4	3	0	a	n	n	n	y	4	$2,140,923	$4,825,823
1980	ofc	y	5	3	5	5	5	2	3	4	5	0	5	3	0		y	n	y		3	$4,827,446	
1976	oth	y	5	4	2	2	1	3	5	5	3	2	3	1	0	g		n	n	y	1	$3,430,507	$5,297,608
1975	ofc	n	5	3	4	5	2	2	1	0	2	0	5	0	0		y				2	$1,981,753	$15,937,339
1982	ofc	y		5	3	3	5	5	3	5	5	0	2	0	0		y	y	n	y	2	$1,122,492	$16,363,166
	oth	y	2	2	2	2	0	1	1	1	1	0	5	0	0	x					5	$1,845,630	$52,338,242
	ofc	y	0	5	5	2	0	0	2	2	2	1	0	2	0	c	n	n	n	y	3	$3,785,076	$24,198,601
	ofc	y	3	2	2	2	1	0	0	2	1	1	5	1	0	k	y	n	n	y	4	see resand Cent	
1974	ofc	y	2	5	0	0	0	2	5	1	1	0	3	0	0	b	n	n	n	y	3	$377,661	$363,637
	oth	y	4	2	3	3	3	1	1	1	0	0	5	0	0	x	y		n	y	2	$9,087,015	$12,863,[illegible]
1981	ofc	n	2	3	5	1	0	4	1		0	0	1	1	0	c	y	y			2	$2,311,107	$11,846,168
1976	ofc	y	5	5	3	3	3	4	1	1	1	1	3	3	1	b	n	n	n	y	4	$1,126,507	$10,624,683
1983	ofc	y	4	3	3	2	1	4	4	1	4	1	2	1	1			n	n	y	4	$337,384	$240,198
1983	ofc	y	5	5	3	3	3	0	4	3	5	3	2	2	1	b	y	n	y	y	4	$750,000	$1,644,497
1976	ofc			3	2	2	2	2	4	4	3	3	3	3	1				n	y	3	$615,300	$5,668,199
	res	y	3	3	4	4	5	1	0	0	0	0	4	3	1	k	y	n	n	y	2	$1,706,246	$6,412,756
1979	oth	y	5	5	4	4	3	5	5	5	3	4	5	3	1	5	k	y	n	y	2	$1,128,000	$2,293,639
1983	ofc	y	5	5	3	3	4	4	4	4	4	4	5	1	1	5	n	y	n	y	4	$326,938	$15,509,859
1980	ofc	y	5	4	5	4	5	5	5	4	5	5	5	2	2	5	y	n	n	y	3	$10,049,507	$56,721,880
1979	ofc	n	4	4	4	3	3	4	3	1	1	4	3	3	2				n	y	3	$691,846	$5,886,101
1979	ofc	n	4	3	5	4	4	2	2	5	4	4	5	0	2	c		n	n	y	2	$672,738	$5,568,264
1976	ofc	n	2	4	4	4	4	3	3	4	4	4	5	2	2	x	y	y	y	y	5	$1,902,276	$11,869,677
1981	ofc	y	5	3	5	5	4	5	4	3	3	4	5	3	2	k	y	n	y	y	1	$8,833,107	$42,[illegible]47,382
1978	ofc	y	5	5	5	4	4	4	5	4	5	5	5	3	3			n	n	y	4	$5,870,846	$45,482,353
1978	oth	y	5	5	3	3	4	4	5	4	5	5	5	3	3		y	n	n	y	4	See Eda cent?	
1981	res	n	4	4	4	4	2	4	4	1	2	4	3	3	3		n	y			5	$2,461,846	$13,179,274
1981	ofc	y	5	4	4	4	4	2	3	3	3	4	5	4	3	k	y	y	y	y	2	$1,575,000	$18,856,715
1978	res	n	5	1	5	5	3	0	5	0	0	5	5	3	3				y	y	2	$731,246	$3,169,406
1981	ofc	y	5	5	3	3	4	4	5	4	5	5	5	3	3						5	$7,764,738	$39,055,625
1973	ofc	n	5	5	4	3	4	4	5	3	5	4	3	3	3	g		n	n	y	3	$659,938	$3,380,886
1973	ofc	y	4	2	3	0	1	4	1	1	1	1	5	1	3	k	y	n	n	y	4	$1,350,000	$8,053,755
1985	ofc	y	5	5	5	4	5	1	2	3	3	4	5	1	3	j	y	n	n	y	2	$560,815	$1,235,350
1973	oth	y	5	3	0	1	4	1	3	4	5	4	2	3	3	i	y	n	n	y	2	$4,699,046	$19,[illegible]17,580
1972	res	n	5	3	3	3	1	2	0	0	2	3	4	3	3	k	y		n	y	3	$3,170,738	$8,902,047
1973	ofc	y	5	5	5	4	5	4	5	5	5	5	4	3	4						3	see Eda Cent	
1979	ofc	y	5	4	4	4	4	3	3	4	2	3	4	3	4		y	n			3	$2,033,307	$10,011,799
1973	ofc	y	5	5	5	5	5	2	3	4	4	4	4	3	4		y	y	y	y	1	$1,696,000	$5,398,466
1976	res	y	4	3	5	5	1	1	3	1	4	4	1	4	4	d	n	n	n	y	5	$849,415	$6,971,005
1973	ofc	y	5	5	5	4	5	4	5	5	5	5	4	3	4						3	$22,762,353	$70,355,512
1973	ofc	y	5	5	5	4	5	4	5	5	5	5	4	3	4						4	see Eda Cent	
1975	ofc	n	4	2	3	3	2	2	2	3	2	2	4	3	4	k	y			y	1	$2,700,000	$13,200,288
1981	ofc	y	4	4	5	4	2	3	2	4	2	4	4	3	4	a	y	n	n	y	1	$3,416,646	$13,196,057
1976	res	y	5	4	4	5	0	0	0	0	0	0	0	5	4	l	y	n			5	$760,492	
1980	ofc	y	4	5	4	4	2	4	3	4	5	2	2	2	4	b	y	n	n	y	3	$1,335,384	$7,854,614
1973	oth	y	5	5	5	4	5	4	5	5	5	5	4	3	4						3	see Eda Cent	
1984	ofc	y	5	5	5	5	5	5	5	5	5	5	5	1	5		y	n		y	3	$4,112,800	
1975	ofc	n	5	4	4	4	5	5	5	3	3	5	5	3	5	e	n	y			4	$1,350,000	$7,292,889
1978	ofc	y	5	5	2	3	3	3	3	4	4	4	3	2	5			n	n	y	1	$3,935,830	$23,920,245
1979	ofc	y	5	5	5	5	5	5	4	5	4	5	5	4	5	k	y	n	n	y	1	$2,937,415	$30,192,133
1980	ofc	n	5	4	4	4	3	5	5	3	3	3	5	4	5	a	y				5	$4,162,876	$18,736,440
1982	ofc	y	5	3	3	1	4	5	4	4	2	5	4	1	5			y	n	y	4	$1,350,000	$9,930,109
1983	ofc	y	5	5	5	3	5	3	5	4	4	4		5	5	l	y	n	n	y	3	$16,081,815	$41,949,902

Tenants' Survey Responses

- Raw Data -

type	a	b	c	d	e	f	g	n	i	.	.	&	n	5	.	6	zone
gov p	5					5						5				k	4
gov p												5				k	3
gov p	5				5			5									4
ret	4	3	2	2	2	4	4	4	3	4	5	1	0			x	y y 3
gov p	5	0	0	0	0	0	0	0	0	0	5	0	0			k	2
gov p	5	0	0	0	0	5	0	0	0	0	5	0	0			k	2
gov p	5	2	4	0	0	5	0	0	0	5	0	0	0			k	4
gov p	5	0	0	0	0	5	0	0	0	0	5	0	0			k	1
bus	3	5	5	2	3	3	2	2	0	0	2	1	0			b	y y 2
ret	0	0	5	0	0	2	5	0	0	0	0	0	0			g	n y 4
gov p	5	0	0	0	0	5	0	0	0	0	0	0	0			k	4
gov f	4	2	5	5	2	2	3	0	0	5	0	0				k	3
gov p	5				5					5	0	0				k	3
gov p	5	2	4	0	0	5	0	0	0	5	0	0	0			k	2
gov p	0	3	3	0	0	5	1	0	0	0	0	0					4
ret	5	5	5	3	4	1	5	2	5	5	5	0	0			i	n y 3
ret	5	1	1	3	5	3	3	0	0	5	1	0	0	5		e	y y 4
gov p	5	0	0	0	0	5	0	0	0	0	5	0	0			k	5
gov p	5	0	0	0	0	5	0	0	0	0	5	0	0			k	5
bus	3	2	3	1	0	3	1	3	2	2	4	1	1			x	y y 2
bus	3	4	4	4	2	4	4	4	4	4	2	1				n	y 3
bus	5	4	4	4	5	1	4	2	4	5	3	1	1				3
ret	4	5	5	5	5	3	5	4	5	5	4	2	1			e	y y 3
bus	4	4	4	4	4	2	3	3	4	2	2	1	1			i	y y 1
ret	0	0	0	0	5	2	1	5	0	5	3	0	1			j	4
bus	3	3	3	2	0	3	0	3	0	0	3	1	2	3		h	y y 2
ret	5	5	5	5	5	3	5	2	3	5	5	2	2			g	:
bus	3	4	4	2	4	3	4	1	3	1	2	0	2			i	y 3
gov a	4	4	4	5	2	3	3	2	2	3	3	2	2			d	y y 2
ret	4	4	2	2	5	3	5	2	5	5	4	0	2			e	y 1
bus	3	4	2	2	0	5	2	4	1	1	1	1	2				n y 1
bus	3	3	4	4	1	3	1	3	0	0	3	3	2				3
bus	4	2	4	4	1	5	3	3	1	1	5	1	3			k	y 1
bus	3	4	4	1	0	3	0	3	0	0	4	2	3			k	y y 3
bus	4	4	2	2	2	4	2	2	3	4	4	2	3			k	y y 4
bus	5	5	5	3	3	3	5	5	3	3	5	3	3			k	y y 4
gov p	5	0	0	0	0	5	0	0	0	0	5	0	3			k	4
ret	3	2	2	2	3	2	1	3	3	2	3	3	3			g	n y 3
gov p	1	3	2	3	0	5	5	3	2	1	4	3	3	5		n	n y 3
ret	3	4	3	2	5	2	5	4	5	5	4	1	3				3
bus	5	5	5	5	0	3	3	0	5	0	5	0	3			k	y y 5
bus	5	5	5	5	5	5	5	5	5	5	5	4	4			j	n n 1
ret	4	4	3	2	3	2	5	3	5	5	4	3	4			g	y y 5
bus	5	3	4	2	3	5	5	4	5	5	3	2	4			i	y y 5
bus	4	4	4	4	4	4	4	5	5	4	5	3	4			h	y y 1
ret	4	4	4	4	5	3	3	5	5	4	2	4				e	y y 5
bus	4	4	3	1	0	4	4	3	0	0	5	0	4			k	y y 4
bus	3	3	4	2	0	5	5	0	2	2	3	1	4			e	y y 1
bus	5	3	4	4	1	5	5	5	3	4	5	0	5			k	y y 3
bus	5	5	2	2	3	5	4	5	4	4	4	0	5			b	n y 5
bus	5	5	5	3	3	5	5	5	5	5	2	5					y y 3
bus	4	3	1	1	0	4	0	5	3	5	5	3	5			k	y y 3
ret	5	5	5	5	5	5	5	2	5	5	3	1	5			i	y y 3
ret	5	5	3	3	5	4	5	3	5	5	3	2	5			g	y y 2